

on the costa, nearly parallel thence with the outer margin. S. t. line pale, a little irregular, marked by a dusky preceding shade. There is a series of interspaceal terminal lunules. Fringes concolorous. The claviform is vaguely traceable in some examples, wanting in others. Orbicular large, irregularly ovate, oblique, paler than the ground, the margins edged with darker scales. Reniform large, kidney-shaped, paler than the ground, incompletely defined by a yellowish annulus and brown marginal scales. Secondaries smoky whitish, paler at the base, the veins and a discal lunule darker. Beneath yellowish-white. The disc of primaries smoky; both wings with an incomplete, diffuse median shade line and a smoky discal spot. Expands 1.48-1.68 inches = 37-42 mm.

Habitat: Brandon, Manitoba; Calgary, Canada, July 5-12 (F. H. Wolley Dod).

Two males and three females are before me at present; others are in the collection of Mr. Dod, who called my attention to the species. In general appearance it resembles *silens*, but does not have the black basal streak nor the blackish suffusion between the ordinary spots. On the other hand it does have more complete, better marked median lines. Attention once drawn to the species, its distinctness is clear and its association is with *basalis*, from which, however, it differs obviously in color.

NOTES ON COCCINELLIDÆ. — II.

BY CHARLES W. LENG, B.S.

(PLATES XIV AND XV.)

Tribe II. *Coccinellini*.

Front coxal cavities closed; base of antennæ exposed; metasternal and ventral coxal lines distinct; body loosely articulated, not very contractile; usually rounded in outline, sometimes oblong, never pubescent above.

The technical definition of this tribe is given above; it includes those lady-bugs most commonly met with, as the two-spotted lady-bug (*Adalia bipunctata*) often found in houses, and the nine-spotted lady-bug (*Coccinella 9-notata*) which is abundant in gardens; most of the species are about the size of these common representatives of the group, round and convex. They feed on plant lice and are useful insects.

The genera are by no means strongly separated. The following table is based upon that printed by Major Casey in this Journal (Vol. VII, No. 2, June, 1899), simplified by the omission of the foreign

forms and by the suppression of some genera that seem unnecessary. The Psylloborini are included to avoid the division into so many groups. The term "metacoxal plate" is used for that portion of the first ventral segment included above the ventral lines visible on that segment in this and following groups (see sketch of under side on plate XIV).

Body larger, antennæ shorter with last joint truncate.

First ventral lines arcuate, continuous, not quite entire, the metacoxal plates shorter than the segment; body oval **Adalia.**

First ventral lines curving outward to the sides of the body along the first suture, the included area (or metacoxal plate) frequently divided by an oblique line; body usually rounded.

Tarsal claws with a large subquadrate tooth at base..... *Coccinellæ.*

Tarsal claws cleft within **Neomysia.**

Body smaller; antennæ slender with last joint elongate..... **Psyllobora.**

Division of Coccinellæ.

Metacoxal plates divided by an oblique line joining the bounding arc at about its middle point, forming an angulate inner plate..... **1**

Metacoxal plates not or only partially divided, the oblique line obsolete or feeble... **2**

1. Oblique line meeting the bounding curve at middle of segment; elytra blue.

Agrabia.

Oblique line meeting the bounding curve at hind margin of segment... **Coccinella.**

2. Mesosternum truncate with a minute notch at middle..... **Harmonia.**

Mesosternum broadly and deeply sinuate.

Prosternal process narrow, strongly bicarinate **Anisocalvia.**

Prosternal process broad, strongly convex in a transverse direction and prominent at the apical margin **Anatis.**

To a large extent the markings of the thorax are uniform throughout each genus and reference to the figures will save minute study of the under surface which, as specimens are ordinarily mounted, is not easy.

Of the genera tabulated by Major Casey, *Neoharmonia*, *Cycloneda* and *Olla* are included above with *Coccinella*—*Neomysia* replaces *Mysia* of the check list. *Cleis* is included with *Harmonia*.

Adalia *Muls.*

Thorax with a broad M-shaped median black design, the broad pale margins immaculate..... **bipunctata.**

Thorax with M-shaped design and a black point at the center of the broad yellow margin..... **frigida.**

Thorax with M-shaped design and a submarginal black spot; elytra with transverse series of spots or transverse bands..... **annectans.**

Thorax black with narrow pale apical and lateral margins..... **humeralis.**

3067. **A. bipunctata** Linn., Syst. Nat., 1758, p. 364. [*bioculata* Say.]

Oval, black; tarsi and sides of abdomen rufescent; head with two yellow frontal marks; thorax yellowish-white with an M-shaped median black design, the broad pale margins immaculate; elytra red with a tolerably large rounded discoidal black spot; thorax obsolete punctulate, elytra punctate; the first ventral line is semicircular and nearly complete. Length, 3.8-5.2 mm. = .15-.21 inch.

Distributed by commerce widely over the world.

3066. **A. frigida** Schneider, 1792, Neu. Mag. Ent., p. 172.

Oval, black; tarsi rufescent; head with two yellow frontal spots; thorax yellowish white with an M-shaped black design and a black spot at the center of the broad yellow margin (or black with the front, sides and basal bilobed spot yellowish); elytra red, either immaculate or with two spots black or with two black bands; thorax absolutely punctulate, elytra punctate; metacoxal plates extending to apical third or fourth of first ventral segment. Length, 3.2-4.8 mm. = .14-.19 inch.

Occurs in Europe and Siberia and across the northern part of this continent, extending as far south as Ohio, Kansas, Missouri and Nebraska.

The following varieties are based on the differences in elytral ornamentation:

Elytra immaculate, Mass., Maine.....unnamed.

Elytra immaculate or with two faint spots, Vancouver and California* (Ohio?)

melanopleura Lec.

Elytra with two distinct spots or with one of them faint, Canada and Mass., Mo.

ophthalmica Muls.

Elytra with two bands, Wis. and Mass.....**disjuncta** Rand.

Elytra with a median band broken and a subapical transverse spot, Colorado.

ornatella Csy.

The localities stated for these varieties are taken from my own collection only and are therefore incomplete. I have not placed *hyperborea* Payk.; it is cited by Crotch as a synonym of *frigida*. Crotch uses *barda* Lec. for the first variety erroneously, this being a synonym of *C. juliana*.

3063. **A. annectans** Crotch, Trans. Am. Ent. Soc., 1873, p. 371.

Oval, black; tibiae, antennæ and mouth pale reddish; head with two white spots bordering the eyes; thorax short, yellowish-white, with a lateral dot and a discoidal M-shaped mark black (this design is variable); elytra reddish-yellow with a common scutellar spot (sometimes bilobed) and each with seven others black; two small near the base (the outer one largest), three across the middle (the outer smallest), two before the apex; elytral pattern very variable, the spots sometimes connected, forming irregular bands; elytra punctate; metacoxal plates somewhat angular postero-externally. Length, 4-4.5 mm. = .16-.18 inch.

Occurs in Colorado, New Mexico and California and is closely allied with the preceding.

The following varieties have been described :

Submarginal spot of thorax isolated or nearly so ;

Elytral spots entirely disconnected, Cal. **ovipennis** Cty.

Submarginal spot of thorax broadly amalgamated with the central black design ;

Elytral spots connected to form bands, N. Mex. **transversalis** Cty.

It seems to me probable that still other variations in the elytral markings may be found so as to form a complete series connecting this and the preceding species ; but with the material before me they appear sufficiently distinct to remain as species for the present.

— . **A. humeralis** Say, Jour. Ac. Nat. Sc. Phil., IV, p. 95.

Oval, black ; head with two reddish spots ; thorax with narrow apical and lateral margins reddish-yellow ; elytra with subquadrate humeral blotch red and a round spot behind the middle also red (sometimes lacking). The elytra have also a very fine yellow side margin not always evident ; metacoxal plates parabolic, extending nearly to apical third. Length, 4-5 mm. = .16-.20 inch.

Widely distributed but rare in collections : Canada, Nova Scotia, Massachusetts, New York, Middle and Western States, Nebraska, New Mexico, Arizona, Utah, California.

3068. **A. ludovicæ** Muls., Mon., p. 36.

“ Head and thorax whitish, that black posteriorly, this with five black spots ; elytra red, disk with a large black dot ; ventral segments and legs orange, those black on the middle. Length, 3 mm. = 1.25 inch.

“ North American (Felix).”

This description, quoted by Crotch, has not been identified by Major Casey ; it is possibly a mistake to include the name longer in our lists.

Agrabia Casey.

3070. **A. cyanoptera** Muls., 1851, Spec., p. 82.

Oval, moderately convex, pale rufo-testaceous above and beneath, except the elytra which are bright blue, sometimes with a feeble greenish tinge, the side margins very narrowly testaceous from the humeral angles to apical four fifths, where the pale margin is inwardly dilated, forming an elongate, internally arcuate spot, which narrows and disappears completely very near the sutural angles ; punctures strong and rather close-set, somewhat unequal. Length, 5.5 mm. = .22 inch.

Occurs in Mexico, New Mexico, Arizona. Rare in collections.

Coccinella Linn.

May be divided into subgenera as follows :

Thorax with subquadrate pale spots at apical angles, sometimes also with apical margin pale **Coccinella**.

Thorax black, variegated with pale markings or yellow with black spots.

Body somewhat depressed.....**Neoharmonia.**

Body convex ;

Mesosternum truncate anteriorly.....**Cycloneda.**

Mesosternum broadly and rather feebly sinuate.....**Olla.**

These subgenera are supported by other characters for which the reader is referred to Major Casey's "Revision." They are used here as a convenient division of the genus *Coccinella*.

Subgenus **Coccinella.**

All the species are similarly marked on the prothorax, viz.: a quadrate white spot in each apical angle. The apical margin is more or less white, varying according to the species. The head is also more or less white. By the variation in the elytral markings the species may be separated as follows :

A. Body larger, 5-7 mm.;

Elytra normally nine-spotted.....**9-notata.**

Elytra normally with five large marks, the median being an oblique band.

monticola.

Elytra normally with subbasal band and four spots.....**transversoguttata.**

Elytra normally immaculate.....**californica.**

B. Body smaller, 4-5 mm.;

Elytra normally with three bands.....**trifasciata.**

Elytra with subbasal band, tricuspid in front and two spots.....**tricuspis.**

Arranging the species by the markings of the head and thorax the same result follows :

Head white in front; thorax with pale apical margin; suture of elytra narrowly black; elytral markings usually consisting of nine spots but variable; meso and meta-epimera white.....**9-notata.**

Head with two white spots in front; thorax without pale apical margin; suture of elytra never black; meso-epimera white.

Elytral markings tending to form transverse bands.....**transversoguttata.**

Elytral markings heavy, oblique.....**monticola.**

Elytra immaculate.....**californica.**

Body smaller; head with two spots or entirely pale; thorax with pale apical margin usually broad; suture of elytra never black; meso and meta-epimera white.

Elytral markings, when complete, three bands, varying to immaculate.

trifasciata.

Elytra with subbasal band tricuspid in front and two spots.....**tricuspis.**

The differences that separate *monticola* and *californica* from *transversoguttata* are no greater than those existing between the varieties of *trifasciata*, but they are a little more constant and are supported by geographical distribution indicating former geographic races that have now become permanent species. I believe that ultimately *subversa*

Lec., now regarded as a variety of *trifasciata*, may become equally established as a definite species.

The expression "normally" is used because great variation in marking is liable to occur, as will be explained in dealing with each species.

3058. **C. 9-notata** *Herbst*, Käfer, V, 1793, p. 269.

Hemispherical, black, alutaceous, very obsoletely punctulate; meso- and meta-epimera white; elytra orange with a common sutural spot, one on the callus, one small near the margin (sometimes connected with the preceding), one large discoidal and one subapical, black; suture of elytra very narrowly black; head pale, posteriorly margined with black; apical margin of thorax white. Length, 5.5-7.0 mm. = .22-.28 inch.

Occurs in the Atlantic region, and west to Oregon. Four specimens taken at Dilley, Ore., by Miss Dennis. The following varieties have been described:

3058a. Var. **franciscana** *Muls.*, 1853, Opus. Ent., III, p. 19.

Elytra spotless. — Occurs in Mexico and should be dropped from our list. Major Casey places this name as a synonym of *californica* which view would also drop the name from our list.

——. Var. **degener** *Casey*, l. c., 1899, p. 88.

"Elytral spots very small and feebly developed, the subhumeral and posthumeral reduced to small points, the juxta-sutural transversely linear and much smaller than the transverse subapical, which is the largest; coloration as in *q-notata*, the body smaller." Length, 4.7-6.3 mm. = .18-.25 inch.

Occurs in New Mexico, Arizona, Colorado.

One specimen from Nebraska in which the posterior spots are obliterated is included under this name.

3060. **C. monticola** *Muls.*, 1851, Spec., p. 115. [*lacustris* Lec.]

Hemispherical, black, alutaceous, very obsoletely punctulate; meso-epimera only white; elytra orange with a large scutellar spot, and each with a broad oblique medial fascia, and a shorter subapical one, black; suture of the elytra never black; apical margin of thorax not white; head with two pale spots. Length, 6-7 mm. = .24-.28 inch.

Occurs in Lake Superior, Oregon, Vancouver, Colorado and California (Tallac and Kern Co.).

The following variety has been described.

——. Var. **suturalis** *Casey*, 1899, l. c., p. 89.

"Body more narrowly oval than usual in this group and very much less convex, the pronotum finely but strongly and closely punctured, with the pale spot at the apical angles small and subquadrate; elytra with an even oblique band just before the middle, terminating at equal distances from the suture and margin, and also with a

short transverse spot at apical fourth or fifth; subhumeral spot completely obsolete the punctures rather strong and close set.

"*Elytral suture broadly black* from the rhomboidal scutellar spot to the apex, toward which the vitta is noticeably broader. Length, 5.7 mm. = .23 inch."

Occurs in Colorado.

I have not seen this variety — Italics in the description quoted above are mine.

3059. **C. transversoguttata** *Fald.*, 1835, *Mém. Ac. Petr.*, II, p. 454. [*5-notata* Kirby.]

Hemispherical, black, alutaceous, very obsoletely punctulate; meso-epinera only white; elytra orange with a subbasal common fascia, a transverse medial spot near the suture and another towards the apex near the margin, black; suture of the elytra never black; apical margin of thorax not white; head with two pale spots. The elytral markings subject to much variation. Length, 6-7.5 mm. = .24-.30 inch.

Occurs over a wide range, Massachusetts, Ontario, Colorado, Utah, Wyoming, Idaho, Kansas, Hudson's Bay Territory, California, Oregon and Siberia.

The following varieties have been described:

3059a. Var. **nugatoria** *Muls.*, 1851, *Spec.*, p. 1021.

Basal band reduced to scutellar spots and two subhumeral spots.

The name *transversalis* used in the check list is preoccupied.

Occurs in Utah and Colorado.

3061. Var. **prolongata** *Cr.*, 1873, l. c., p. 371.

"Very like *C. 5-notata* (= *transversoguttata*), and intermediate between it and *C. monticola*, punctuation more obsolete (much as in *C. 9-notata*); elytra as in the variety *transversalis* (= *nugatoria*), the humeral spot never present, but often with a small submarginal spot beyond the medial one (one even with a medial fascia). Length, .27-.29 inch. Utah, Kansas, California.

"This differs from the others by the anterior angles of the thorax, the white spot is prolonged acutely on the disc, and the margin is often narrowly white."

Basal band reduced to scutellar spot; medial spot extending nearly across the elytra, complete or broken, suture not black.

— Var. **impressa** *Casey*, 1899, l. c., p. 89.

"Scutellar spot large, transversely suboval or elliptical, the subhumeral always wanting; suture never black; pronotum polished, the minute punctures well separated, the pale spot at the apical angles moderate in size and subquadrate; elytra each with a long oblique spot just before the middle and another shorter near the apex; submedian oblique fascia tending to disintegrate into an outer, smaller and inner and larger spot; body more broadly oval, polished, strongly punctured toward the sides of the elytra, the impression along the side margin of the pronotum extending arcuately inward just before the middle, disappearing at some distance from the edge; inner part of the abdominal plates acutely angulate behind. Length, 6.4 mm.; width, 5.0 mm. California."

— . Var. **alutacea** Casey, 1899, l. c., p. 89.

"Scutellar spot large, transversely suboval or elliptical, the subhumeral always wanting; suture never black; pronotum strongly alutaceous, the minute punctures deep and close-set, the pale spot at the apical angles large, extending to basal third; body oval, very strongly convex, the elytra dull, finely and feebly punctate, each with a transverse spot at the middle as in *5-notata* (*transversoguttata*), and a small rounded spot near the margin and somewhat more anterior, the two sometimes sub-united, the subapical transverse spot nearer the margin than the suture. Length, 6.7 mm.; width, 5.2 mm. New Mexico."

3059b. Var. **californica** Mann., 1843, Bull. Mosc., II, p. 312.

Closely resembles the preceding and differs by the immaculate elytra. Major Casey mentions a rare spotted form, but all that I have seen are readily assigned to *9-notata*. Length, 6-7.5 mm. = .24-.30 inch.

Occurs in California, Oregon and Washington.

3056. Var. **trifasciata** Linn., 1758, Syst. Nat., ed. X, p. 365. [*perplexa* Muls.]

Hemispherical, black, punctulate; thorax at the anterior angles with a quadrate white spot above and below and the anterior margin white; elytra orange with three fasciæ black, one subbasal, common, the others medial and subapical, abbreviated at both ends; head ♂ entirely white in front; ♀ with two white spots; meso- and meta-pimera white. Length, 4.5-5 mm. = .22-.25 inch.

Occurs throughout the northern United States and Canada. The following varieties occur:

3056a. Var. **juliana** Muls., 1856, Opusc. Ent., VII, p. 135.

Elytra with the basal band only.

Occurs in Oregon and California (northern and middle coast regions) [*barda* Lec.].

3056b. Var. **subversa** Lec., 1854, Proc. Ac. Nat. Sc. Phil., p. 19.

Elytra usually immaculate but indications of all the normal markings of the species are liable to rarely occur. I am indebted to Miss Florence Dennis, of Dilley, Ore., for a large number of this variety.

3057. **C. difficilis** Cr., 1873, Trans. Am. Ent. Soc., p. 370.

Elytral markings reduced to scutellar spot, one or two medial spots, small and a large subapical spot.

Occur in Utah and Colorado.

— . Var. **eugenii** Muls., 1866, Mon., p. 95.

Basal band divided, other bands entire.

Occurs in California (Tallac and Siskiyou.)

Besides the described varieties of *trifasciata*, many other variations in the elytral markings will be found on the Pacific coast where the greatest instability seems to exist. Doubtful forms should be called *subversa*, that being the earliest described variety.

——. Var. **nevadica** Casey, 1899, l. c., p. 88.

"Scutellar spot small and oblong or rhomboidal; pronotum without a pale apical margin; elytral suture not at all darker in color; body broadly oval, strongly convex, the pronotum black with a subquadrate pale spot at each apical angle, the punctures fine and unusually close-set, giving a feebly alutaceous luster; elytra immaculate, except a small black scutellar spot flanked at each side by a pale spot at the basal margin, the punctures fine and rather close-set, becoming quite strong laterally; abdominal plates strongly defined, broadly ogival in form internally. Length, 5.8 mm.; width, 4.5 mm. Nevada (Reno)."

Major Casey places this variety near *g-notata*, but on account of the absence of sutural darkening and pale apical margin of pronotum it seems to belong with *3-fusciata*.

3062. **C. tricuspis** Kirby, 1837, Faun. Bor. Am., IV, p. 231.

Elytra strongly punctulate, shining; black, ovate, less convex, thorax with the anterior angles triangularly whitish; elytra orange with a common black subbasal fascia, tridentate in front, and each with a triangular subapical spot black. Length, 4 mm. = .20 inch.

Occurs in Hudson's Bay Territory, Canada, Lake Superior, Kansas, Siberia, Michigan. Rare in collections.

C. menetriesi Muls., 1851, Spec., p. 104.

This species, *vide* Crotch, is not rare in parts of Siberia, Mongolia, Persia and Egypt, but though described from California, there is no other record of its occurrence in our territory. The name should be dropped. I add the description however to aid in identification in case it should be found.

Oval; prothorax black, sides bordered with yellowish-white more broadly in front; elytra orange, paler at the sides of the scutellum, sometimes immaculate, usually with a common scutellar black obcordiform spot and five others on each, arranged as follows: one on the callus, small, one at two sevenths submarginal large, oval and transverse, one subsutural at three sevenths also large, one submarginal at two thirds, one subsutural at three fourths; the four spots forming two oblique pairs, the outer spots being nearer the base than the inner; epimera white. Length, 4.5–5.6 mm. = .18–.22 inch.

Occurs in Russian Asia (and California?).

Cited by Gemminger and Harold as a variety of *undecimpunctata* L.

Subgenus **Neoharmonia** Casey.

Separated from *Coccinella* by the form and ornamentation of the body, more broadly reflexed side margins, more depressed surface and emarginate mesosternum. The punctuation also is distinct.

Includes *Coccinella affinis* Rand., and its variety *venusta* Muls. (3055 and 3055a of check list) and the Mexican species *ampla*. The

name *affinis* was cited in error by Crotch, being a synonym of *Hyperaspis binotata* and disappears entirely. Major Casey regards the variety as a valid species so that we have three species :

— . **N. venusta** *Melsh.*, 1846, Proc. Ac. Nat. Sc. Phil., III, p. 178.

Broadly rounded, feebly convex ; head black, yellow along the eyes ; pronotum pale, with a large oblique black fasciæ at each side and two approximate median spots, sometimes united with basal fasciæ ; elytra pale yellow or reddish, each with two large subbasal black spots, another near the margin before the middle, also a large spot near the margin at apical fourth united with a common sutural vitta, also with a rounded spot before the middle and near the suture, prolonged obliquely forward ; under surface and legs blackish. Length, 6 mm. = .24 inch.

Occurs in Indiana, Arkansas, Kansas and Louisiana.

— . **N. notulata** *Muls.*, 1851, Spec., p. 83.

Similar to the preceding, but black above and beneath ; pronotum with wide oblique pale border narrower toward the base ; elytra each with a transverse pale or reddish fasciæ of irregular design. Length, 5-6 mm. = .20-.24 inch.

Occurs in Louisiana.

The relation between these two species remains doubtful from lack of sufficient material.

— . **N. ampla** *Muls.*, 1851, Spec., p. 82.

Similar to *venusta* ; pronotum with two black longitudinal vittæ each side of the middle ; elytra with two black spots near the base, three spots at two fifths and two blotches at four fifths ; the marks on pronotum sometimes confluent. Length, 5-6 mm. = .20-.24 inch.

Occurs at Brownsville, Texas (Mr. Charles Schaeffer), and in Mexico. It will be figured in a subsequent number.

Subgenus **Cycloneda** *Crotch.*

3064. **C. sanguinea** *Linn.*, 1763, Amœn. Acad., VI, p. 393.

Black, alutaceous, finely punctulate, thorax with the front, sides and hind angles bordered with white, the front margin gives off three white branches, the lateral ones sometimes reaching the base ; elytra bright red, spotless ; ♂, head white in front ; prosternum and meso-epimera white ; ♀, head with two white spots, body black ; tibial spurs short and weak, metasternum margined, form convex ; thorax rather broadly reflexed, metacoxal line following the apical margin of the ventral segment but distinct from it, epipleure of elytra concave. Length, 4-6 mm. = .16-.24 inch.

Occurs in North and South America, abundant.

The following varieties have been described :

Sublateral pale spot of thorax isolated.

Elytra generally luteo-flavate.....	immaculata.
Elytra deep and bright scarlet.....	rubripennis.

Sublateral pale spot of thorax united to the pale apex ; body smaller.

Elytra luteo-flavate **munda**.

Elytra generally bright scarlet **polita**.

— . Var. **immaculata** *Fab.*, 1792, Ent. Syst., I, 1, p. 267.

Pronotum black, with a narrow pale side margin extending with equal width posteriorly and internally along the base, terminating abruptly at about lateral sixth and sometimes extending more narrowly along the median parts of the apex, also with an isolated small pale spot at the middle of the length and lateral fourth ; body broadly oval but distinctly longer than wide, the marginal bead of the elytra not or only slightly darker ; metacoxal plates devoid of any trace of an oblique line ; elytra generally luteo-flavate, without distinct paler spaces at the sides of the scutellum ; pronotum of the female generally with the apical margin narrowly pale, usually subinterrupted at the middle and not posteriorly spurred. Length, 5.7–6.0 mm. = .23–.24 inch.

Occurs in Florida, Georgia and Louisiana.

This is a well-marked race and probably exists in all collections possessing southern specimens.

— . Var. **rubripennis** *Casey*, 1899, l. c., p. 92.

Elytra deep and bright scarlet, with a short transverse paler spot at each side of the scutellum which is black as usual ; pronotum relatively narrower than in *immaculata* and rather more strongly rounded at base, the median length relatively greater when compared with the sides, having a narrow apical margin with narrow parallel posterior prolongation pale in the male, the female interruptedly margined with paler and without a medial spur. Otherwise as in preceding. Length, 4.4–5.8 mm. = .18–.23 inch.

Occurs at Brownsville, Texas, in Colorado, and in southern California. This is also a well-marked race. The original description of *rubripennis* is copied from Major Casey's paper, as well as his description of *immaculata*, so that the reader may follow his exact words.

— . Var. **munda** *Say*, Journ. Bost. Soc. Nat. Hist., I, p. 202.

Pronotum as in preceding, except that the apical margin is broadly pale, with a posterior medial spur short and triangular, and the sublateral pale spot is united to the pale apex, but does not join the basal pale area ; body more elongate-oval, the elytra luteo-flavate, with more narrowly reflexed margins, which are always paler. Length, 4–5 mm. = .16–.20 inch.

Occurs in the Atlantic and Middle States.

This is the common form of *sanguinea* with us in the East.

— . Var. **polita** *Casey*, 1899, l. c., p. 93.

Pronotum as in preceding except that the sublateral spur is longer, frequently joining the basal pale border so as to leave a black spot isolated ; medial spur long and narrow, gradually acuminate and extending to or beyond the middle of the disk ; body smaller and rather more rounded, the elytra generally bright scarlet and with almost completely obsolete punctures, occasionally yellow and in a northern example, with more distinct punctuation. Length, 3.8–4.7 mm. = .15–.19 inch.

Occurs in California, Washington, British Columbia, Idaho, Oregon, Vancouver.

This is the extreme northwestern form of the species.

The species *hondurasica*, *limbiter* and *ater* described in Major Casey's paper should not be included in our lists, two being from outside our limits and one, *ater*, from an unrecorded locality. The description of the last is as follows :

"Pronotum completely black ; body broadly rounded and rather less convex, shining deep black throughout above and beneath, the sides of the prothorax rather less arcuate, and the basal angles more narrowly rounded ; elytral punctures much larger and more distinct than usual, but sparse. Length, 4.3 mm. ; width, 3.5 mm."

Unique type found in Levette Cabinet but had no label attached.

Subgenus *Olla* Casey.

3065. *O. oculata* Fab., 1792, Ent. Syst., I, p. 287.

Black, alutaceous, very obsoletely and finely punctulate ; abdomen red, epimera white ; elytra each with an irregular red discoidal spot before the middle ; thorax with the apical margin and sides white ; head white in front in male.

Length, 4-5.5 mm. = .16-.22 inch.

The original description of Fabricius is incorrect, in describing a larger round white spot on each side the thorax, as pointed out by Major Casey but clearly refers to this insect.

Occurs in Southern States and Mexico, North Carolina to California.

Major Casey discards the name *oculata* for this species and divides it into three varieties which seem in my series too inconstant to consider well defined. They differ as follows :

——. Var. *plagiata* Casey.

Apical margin of thorax not white ; elytral spot irregularly transverse, emarginate internally at apex and externally at base.

Type Locality : Texas, Arizona and California.

Many Texan specimens however have the pale apical thoracic margin.

——. Var. *sobrina* Casey.

Apical margin of thorax pale and with a median spur pale ; elytral spot triangular externally truncate, inner angle rounded.

Type Locality : Florida.

——. Var. *fenestralis* Casey.

Apical margin of thorax not pale, pale lateral margin incomplete ; elytral spot semicircular, base straight.

Type Locality : Las Vegas, New Mexico.

I have not seen this form, which may be an individual variation of *plagiata*.

3065a. **O. abdominalis** Say, 1824, Journ. Ac. Nat. Sc. Phil., IV, p. 95.

Entirely pale ochreous, thorax with seven black dots, five discoidal (forming an M-like mark), two lateral; elytra each with eight black dots, four subbasal, three medial, one submarginal before the apex; broadly oval and strongly convex, very finely and obsoletely punctulate, side margins of elytra quite broadly reflexed; under surface and legs pale. Length, 4.25-5.25 mm. = .17-.21 inch.

Occurs from Indiana to Texas, Arizona and California.

There is little variation in this species; Crotch describes a form with a large black triangular mark in the posterior half of the elytra which I have not seen; several specimens in my collection lack part of the elytral spots.

There is no apparent reason for classing this as a variety of the preceding. The name *sayi* Crotch, List Coccinellidæ, 1871, p. 6, is synonymous.

Harmonia *Mulsant*.

Metacoxal plates only partially divided, the oblique line feeble or lacking.

3069. **H. picta** Randall, 1838, Journ. Bost. Soc. Nat. Hist., II, p. 51.

Oval, rather depressed; black, legs orange; head yellow with two interrupted frontal vittæ black; thorax punctulate, very short, spotted with yellow and very variable, two approximate spots at middle of base always present, sometimes united; elytra variable, closely and distinctly punctate; underside black, prosternum and epipleuræ yellow, episternum black; mesosternum and three side pieces yellow; metasternum black, episternum and epimera yellow.

The elytra are yellow, without spots in the male, more or less variegated with black in the female which sex is apparently the more abundant. Length, 3.5-5.0 mm. = .15-.20 inch.

The name *contexta* Muls. applies to the female in which the black color forms two transverse bands sublaterally connected; the name *concinmata* Muls. applies to those females in which the elytra are almost wholly black.

Occurs throughout the northern part of our territory and probably wherever pine is found. It attacks aphids living on that tree.

The following varieties have been described:

— . Var. **minor** Casey, 1899, l. c., p. 95.

Sublateral spot of pronotum feebler and usually disintegrated; body smaller, slightly feebler punctures, dark design of elytra paler in color and less developed, ex-

ternal spot near the posterior extremity of the vitta frequently prolonged irregularly to the side margin. Length, 3.7-3.9 mm. = .15-.16 inch.

Occurs in California and Vancouver.

— Var. **hudsonica** Casey, 1899, l. c., p. 95.

Pronotum relatively smaller and with the black design more irregular, with a few black points at the middle of each side of the apex in addition; elytral design less developed, consisting of a fine straight vitta from the callus to the middle at apical fourth, where it is slightly dilated internally, each also with a small elongate dark spot near the vitta internally at two fifths, and another at three fifths from the base at the lateral margin and remote from the vitta. Length, 4 mm. = .16 inch.

Occurs in Hudson's Bay Territory and White Mountains of New Hampshire.

Anisocalvia Crotch.

Metacoxal plate not divided, ventral line continued along the posterior margin of first segment; thorax black, front and side margin usually pale, also a median line more or less complete.

Elytra dark with or without pale spots.....14-**guttata**.

Elytra pale with eleven large rounded or oval black spots.....12-**maculata**.

3071. **A. quatuordecimguttata** Linn., 1758, Syst. Nat., ed. X, p. 367.

♂. Black, legs and sides of ventral segments broadly orange; head orange; thorax black, front margin, side margin, medial line, spot near posterior angle orange, distinctly punctate; elytra dark, brown or nearly black, each with seven pale rounded spots, one near the scutellum, three across before the middle, two across behind the middle and one before the apex, reflexed margin pale throughout. Length, 5-5.3 mm. = .20-.22 inch.

Occurs throughout our northern states to British Columbia, White Mts., Adirondacks, Massachusetts, Wisconsin and Minnesota.

The female differs remarkably from the male and varies, the variations having led to the following names being proposed for its forms.

— Var. **cardisce** Rand., 1838, Journ. Bost. Soc. Nat. Hist., II, p. 32.

Thorax black with narrow apical and lateral margin and median line pale; elytra black with reflexed side margin pale.

3071a. Var. **similis** Rand., 1832, Journ. Bost. Soc. Nat. Hist., II, p. 58.

Thorax as in preceding, the median line abbreviated or lacking, the apical and lateral margins abbreviated; elytra black with an irregular triangular red blotch.

— Var. **victoriana** Casey, 1899, l. c., p. 96.

Thorax with narrow apical and lateral pale margin and abbreviated medial pale line; elytra black with pale side margin toward apex only and a rounded discal pale spot near the suture behind the middle.

In addition to these variations I have seen females in which the pale spots of the males are partly reproduced in conjunction with the characteristic female blotch.

Major Casey does not consider our species identical with the European *14-guttata* (see this Journal, Vol. VII, p. 96); but the differences he names are not constant in the specimens before me and I prefer to adhere to the name used in the check list.

3071b. *S. hesperica* Cr.

This name must be dropped. The description is too imperfect for recognition.

3072. *A. 12-maculata* Gebl., 1832, Nouv. Mém. Mosc., II, p. 76. [*incarnata* Kirby.]

Convex, subhemispherical, black; head black, clypeus in front, labrum and the border of the eyes testaceous; thorax and elytra distinctly and closely punctate with their epipleura testaceous (or pinkish-white alive) and marked with black; tibiae, tarsi, sides of ventral and the whole of the anal segments testaceous; thorax with two large black discoidal marks, leaving only a thin marginal and medial line pale; elytra with two common (one subscutellar, one toward the apex) and five other spots black (one subbasal, two rounded almost contiguous medial, one on the apical third, one triangular apical). Length, 5-5.5 mm. = .20-.22 inch.

Occurs at Lake Superior, Hudson's Bay, Siberia, British Columbia.

The following variety has been described:

— Var. *elliptica* Casey, 1899, l. c., p. 97.

Smaller and more broadly oval, prothorax relatively smaller, sides much more strongly convergent, basal angles more broadly rounded, punctures finer and sparser; elytral spots much larger and narrowly separated, the two transversely placed at the middle, generally confluent. Length, 4 mm. = .20 inch.

Occurs at Hudson's Bay.

Anatis Mulsant.

Metacoxal plate not divided, ventral line effaced externally; prosternum compressed in front, process broad, prominent at apical margin; elytra (♀) with small sutural tomentose patch near apex; thorax with pale sides and usually two basal pale spots.

3075. *A. quindecimpunctata* Oliv., 1808, Ent., VI, p. 1027, t. 6, f. 83. [*labiculata* Say.]

Very broad, rather convex, black; head black, punctate, eyes emarginate by the yellow antenniferous tubercles and two triangular spots on the front yellow; thorax and apical half of epipleura yellowish-white, posterior angles obtuse, alutaceous, finely and closely punctulate, marked with a N-like discoidal spot and a lateral dot black; elytra yellow or reddish-brown alutaceous, closely and decidedly unequally punctulate; sides somewhat explanate, margin itself thickly reflexed, with a row of deeper punctures; legs, sides and apices of ventral segments orange; meso- and meta-epimera white; elytra each with eight black spots, one scutellar, one on the callus, three forming a medial fascia, and three a subapical fascia. Length, 6.5-9.0 mm. = .26-.36 inch.

Occurs throughout the Atlantic region.

The larva is black, variegated with yellow, of the same form as other Coccinellid larvæ, but much larger, measuring five eighths inch when full grown.

Major Casey recognizes the following, heretofore considered a synonym as a valid species. I would rather cite it as a variety.

— . Var. **mali** Say, 1824, Journ. Ac. Nat. Sc. Phil., IV, p. 93.

Elytral spots all surrounded by a broad pale border, the ground tint red brown; the submarginal spot at two fifths geminate; the apical margin of thorax pale throughout, not interrupted as in *15-punctata*. Length, 8-10 mm. = .32-.40 inch.

Occurs in Indiana, Wisconsin, Idaho.

3076. **A. rathvoni** Lec., 1852, Proc. Ac. Nat. Sc. Phil., VI, p. 132.

Elytra decidedly rhomboidal, scarcely as long as wide, strongly dilated at two fifths, where there is a small marginal spot; remainder immaculate or with a few of the spots of the preceding species, the punctures much smaller and nearly equal; basal spots of pronotum large, much extended antero-externally, sometimes even uniting with the lateral pale area and broadly united at base; pale apical margin transverse. Length, 8.3 mm. = .33 inch.

Occurs in California and Oregon.

The following variety has been described:

— . Var. **lecontei** Casey, 1899, l. c., p. 98.

Elytra very broadly rounded or subrhomboidal, slightly more dilated at two fifths, scarcely as long as wide, the punctures strong, bright brownish-red, immaculate entire limb deep black; pronotum black with a broad yellow vitta extending from base to apex, slightly distant from side margin which it joins at apical angle, also with two small pale spots at middle of base sometimes lacking; head black with a small yellow spot beside the eye; legs and beneath black, epipleuræ black in external and red in internal half their width from base to apex. Length, 8.7-10 mm. = .35-.40 inch.

Occurs in New Mexico and Colorado.

Probably more abundant in collections than the typical form.

Neomysia Casey.

Replaces *Mysia* from which it differs in the more narrowly reflexed margins, very fine punctuation and polished surface.

The species may be separated as follows:

Pronotum pale with trapezoidal black space; elytra interruptedly vittate.

subvittata.

Pronotum pale with trapezoidal dark or black space, also with sublateral black spot.

pullata.

Pronotum pale with nubilous brown spots.....**hornii.**

The elytra are feebly or irregularly vittate in some races of the last two species but often immaculate.

3077. **N. subvittata** Muls., 1851, Spec., p. 138.

Oval; pronotum black, sides pale, trapezoidal black space sometimes divided by longitudinal pale line; elytra pale with three interrupted black vittæ, the external vitta narrow, abbreviated at both ends, the middle vitta sometimes complete, united with the interior at base and sometimes at middle, the last not reaching the apex; the union of the vittæ always leaves a small pale spot each side the scutellum and, when complete, leaves also a pale spot before the middle; head dark, sometimes partly pale; body beneath and legs pale in light-colored specimens, brownish in others. Length, 6 mm. = .24 inch.

Occurs in northern California to Vancouver.

The description of Mulsant was written from pale specimens.

N. montana Casey is a dark form of the same species occurring in Montana.

3073. **N. pullata** Say, 1825, Journ. Ac. Nat. Sc. Phil., V, p. 301.

Oval, convex, black; head with two frontal spots yellow; thorax (♂) with broad yellow side margins enclosing a black spot and with a yellow spot before the scutellum (sometimes extended into a median yellow space); thorax (♀) with dark area, pale brown with blackish lateral edges; elytra entirely pale or with irregular dorsal black ill-defined vittæ; legs generally black, meso-epimera white. [*notans* Rand.] Length, 6-7 mm. = .24-.28 inch.

Occurs in Canada, Middle and Southern States.

The following variety has been described:

— Var. **randalli** Casey, 1899, l. c., p. 99.

The elytral markings in this form are more completely developed and it leads toward the Oregon form *subvittata*. The markings are: subsutural vitta from base for three fifths, broadly united at base with a short median vitta, a narrow external vitta from one third to three fourths, and a broad median vitta from three fourths to seven eighths. A whitish basal spot each side of the scutellum. Length, 6.6 mm. = .26 inch.

Occurs at Lake Superior.

3074. **N. hornii** Crotch, 1873, Trans. Am. Ent. Soc., p. 375.

Pronotum pale yellowish-brown with a feeble trace of two basal browner spots; elytra with three feeble incomplete pale brown vittæ, the two inner uniting near the apex and broader, the outer narrow and almost completely obsolete; or entirely pale; thorax and elytra finely punctulate, alutaceous; meso-epimera white. Length, 6-7 mm. = .24-.28 inch.

Occurs in Oregon and California.

The following variety has been described:

— Var. **interrupta** Casey, 1899, l. c., p. 99.

Pronotum with two clouded basal spots and V-shaped spot before the middle; elytra yellow with three fine incomplete vittæ of pale brown. Length, 7 mm. = .28 inch.

Occurs in New Mexico, Colorado and Arizona.

Psyllobora Chev.

Body small, convex, pale in color, spotted with a darker tint above; mesosternum truncate, claws with a large quadrate tooth internally at apex.

Our species are closely related and may be separated as follows:

Elytra without sutural common spots, suture pale;

Each elytron with nine spots of uniform color some of which may be confluent.

20-maculata.

Each elytron with two basal spots and a large reniform discal spot.....**renifer.**

Each elytron with two or three basal spots and seven others variously confluent, sometimes differing in color.....**tædata.**

Elytra with two common sutural spots, the sutural margin narrowly black.....**nana.**

3078. **P. 20-maculata** Say, 1824, Journ. Ac. Nat. Sc. Phil., IV, p. 96.

Small, rounded, convex; pronotum finely but distinctly punctate, elytra strongly and very closely punctured; ochreous white, pronotum with five black spots, the ante-scutellar spot small; elytra with nine spots, two subbasal, two subsutural, three submarginal, two discal, the latter often connected and sometimes joining the others partly together; sternum and middle of ventral segments black, epimera and part of meta-episternum white. Length, 2.1-2.7 mm. = .08-.11 inch.

Occurs in Atlantic region.

The following varieties have been described:

——. Var. **obsoleta** Casey, 1899, l. c., p. 101.

The elytral spots are brown instead of black. Length, 2.15 mm. = .086 inch.

Type Locality: Keokuk, Iowa.

With this I include all the specimens from the Middle West in which the color is pale and the spots begin to suggest the Texan and Californian forms. It seems to me at best a feebly differentiated race.

——. Var. **parvinotata** Casey, 1899, l. c., p. 101.

Ante-scutellar spot of pronotum obsolete; elytral spots smaller and completely isolated. Length, 1.9 mm. = .08 inch.

Occurs in Florida.

This variety appears incorrectly in many collections under the name *nana*, which is described below.

——. **P. renifer** Casey, 1899, l. c., p. 102.

"Body very small, rounded, with very minute sparse punctures; pronotum subimpunctate, the five spots present but pale brown in color; elytra very pale yellowish-white, with brown markings consisting, on each, of two subbasal spots, the outer the larger and with a lobe on the callus, a small faint subsutural cloud at one third, a large bilobed discal spot extending from basal third to apical fifth, prolonged and acuminate antero-externally and a large bilobed and less well-developed fine subapical spot." Length, 1.6 mm. = .065 inch.

Type locality, Brownsville, Texas.

In my series of this species, the outer basal spot of the elytra is in some cases nearly divided and there is also a lack of uniformity in the form of the discal spot as well as some inequality in the depth of color. Crotch mentioned this species as a variety but did not name it.

— **P. *tædata*** Lec., 1857, Rep. Pac. R. R. Exp., IX, p. 76.

Pronotum subimpunctate; elytra with impressed sparse punctures; pronotum with five spots more or less nubilata; elytral spots very irregular, the outer subbasal usually completely or partly divided, many of the spots frequently coalescent and pale brown. Length, 1.9–2.6 mm. = .08–.10 inch.

Occurs in Vancouver, Oregon, California.

The variability of the elytral markings has led to the description of several species, all of which seem to me merely forms of *tædata* and not actually geographical races or subspecies. In the series I have received from the Pacific coast all these forms came from the same locality at one time. For cabinet arrangement these names may be used if desired: *borealis* and *separata* for those with uniformly dark spots, the first when the outer subbasal spot is partly divided, the second when the division is complete; *tædata* and *deficiens* for those with black spots mingled with pale brown spots, the first when two distinct dark submarginal spots are present, the second when these are lacking.

P. *nana* Muls., 1851, Spec., p. 181.

More narrowly oval, ante-scutellar spot of pronotum very small; elytra very minutely sparsely punctulate, with two common sutural spots at one third and two thirds from base, the sutural margin narrowly black, also with eight other spots on each, two basal, one large triangular discal, two submarginal, two subapical, one small discal, variously united; elytra pearly white in color. Length, 2.5 mm. = .10 inch.

Occurs in Cuba, Jamaica and Florida; rare in collections.

Thalassa montezumæ Muls., 1851, Spec., p. 512.

Body bluntly oval, convex, finely punctured; dull metallic green above, head with a small yellow spot; antennæ yellowish, palpi green; pronotum with anterior angles narrowly yellow; elytra each with a reddish irregular spot before the middle; beneath dull greenish-black, abdomen reddish-yellow, paler at the side, tarsi yellowish-trochanters green. Length, 4.8 mm. = .19 inch.

Occurs in Arizona and Mexico.

This species is not rare in Mexico and has been found at Tucson and Williams in Arizona. It may therefore be included in our list.

EXPLANATION OF PLATES XIV AND XV.

Represents the tribe *Coccinellini*. *A*, underside of *Anatis 15-punctata*, showing metacoxal line on first ventral segment at *a*. *B*, various structures much enlarged:

a, tarsi (top view) showing form of second joint; *b*, tarsi (side view) second joint apparently divided; *c*, mandible; *d*, palpus; *e*, end view of last joint of palpus; *f*, antenna. *C*, half of first ventral segment showing form of metacoxal line (*a*) and claw (*b*) of each genus in tribe Coccinellini. For *Psyllobora* the tarsus (*c*) also is shown on account of the oblique termination of the first joint.

The remaining figures show crudely the markings of the species as follows, the size being indicated by the line beside each figure:

1. *Adalia bipunctata*.
2. " *frigida*.
3. " " var. *ophthalmica*.
4. " " " *melanopleura*.
5. " " " *disjuncta*.
6. " *annectans*.
7. " " var. *transversalis*.
8. " *humeralis*.
9. *Agrabia cyanoptera*.
10. *Coccinella 9-notata* (eastern form).
11. " " " "
12. " " (Oregon form).
13. " *monticola*.
14. " *transversoguttata*.
15. " " var. *nugatoria*.
16. " " " *prolongata*.
17. " " " *alutacea*.
18. " *californica*.
19. " *trifasciata*.
20. " " var. *juliana*.
21. " " " *subversa*.
- 22, 23, 24, 25, 26. " " all drawn from the series collected by Miss Dennis at Dilley, Oregon. The common form is that shown by Fig. 21.
27. *Coccinella trifasciata* var. *eugenii*.
28. " " " *difficilis*, ♀.
29. " *tricuspis*.
30. *Neoharmonia* (subgen.) *venusta*.
31. " *notulata*.
32. *Cycloneda* (subgen.) *sanguinea*.
33. *a*. var. *munda* ♂. *b*. var. *munda*, ♀, thorax and head. *c*. var. *immaculata*, thorax and head. *d*. var. *polita*, thorax and head.
34. *Olla* (subgen.) *oculata*.
- 35 and 36. *Olla* (subgen.) *abdominalis*.
37. *Harmonia picta* ♂.
38. " " ♀ form *contexta*.
39. " " ♀ " *concinmata*.
40. " " var. *minor*.
41. " " " *hudsonica*.
42. *Anisocalvia 14-guttata*, ♂.

43. *Anisocalvia 14-guttata*, ♀, form *similis*.
 44. " *12-maculata*.
 Fig. 45 is not drawn from the type.
 45. *Anisocalvia 14-guttata*, ♀, form *victoriana*.
 46. *Anatis 15-punctata*.
 47. " " dark form.
 48. " " var. *mali*.
 49. " *rathvoni*.
 50. " " var. *lecontei*.
 51. *Neomysia pullata*.
 52. " " var. (Ontario).
 53. " *hornii*.
 54. " *subvittata*.
 55. *Psyllobora 20-maculata*.
 56. " " var. *parvinotata*.
 57. " *renifer*.
 58. " *tædata*, form *separata*.
 59. " " " *borealis*.
 60. " " " *tædata*.

The following were omitted from the Plate IV, Vol. XI.

61. *Hippodamia glacialis*, usual form.

62. " " " "

63. " " " unusually dark form taken by Mr. Davis on Staten Island, October 3.

Plate IV, Vol. XI, the right-hand figure of *parenthesis* represents an unusual variety from Tallac, Cal.

LIST OF THE CICINDELIDÆ OF MEXICO AND ON THEIR RELATIONSHIP WITH THE SPECIES OF THE UNITED STATES.

BY WALTHER HORN, M.D.,

BERLIN, GERMANY.

Cicindela schaefferi, sp. nov.

Cicindelæ sinaloæ Bat. similis, differt labro in medio ipso sat producto denteque longo ornato; oculis minus prominentibus; ante sulcum basalem pronoto constricto, angulis posticis minus prominentibus, margine antico in medio producto, basi evidentius (subtiliter) transversim striolata, elytris magis parallelis, superiore lunulæ apicalis parte non anticem versus inflexa sed rotundata, parte inferiore spinam versus incrassata, disco punctis 2 (altero ante medium in illa specie deficiente, altero pone medium ut in *P. sinaloa* Bat.) ornato, macula marginali media fere in puncta duo æqualia dissoluta, serie foveolarum juxta-suturalium (in tertia parte basali foveolis viridilibus!) minus conspicuis. Long., 9 mm.